APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/016,949	12/13/2001	Brian Fahs	10019980-1	7384

7590   05/14/2007

HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER
KANG, INSUN

ART UNIT	PAPER NUMBER
2193	

MAIL DATE	DELIVERY MODE
05/14/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

<table>
<tr><td rowspan="2">Office Action Summary</td><td>Application No.
10/016,949</td><td>Applicant(s)
FAHS ET AL.</td><td></td></tr>
<tr><td>Examiner
Insun Kang</td><td>Art Unit
2193</td><td></td></tr>
</table>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>26 February 2007</u>.

2a)☒ This action is **FINAL**.　　　2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-24</u> is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-24</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☐ All　b)☐ Some * c)☐ None of:

　　　1.☐ Certified copies of the priority documents have been received.

　　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
　　Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
　　Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

1.   This action is in response to the amendment filed 2/26/2007.

2.   As per applicant's request, claims 1, 3, 4, 7, 9, 10, 13, 15, and 16 have been amended.

Claims 1-24 are pending in the application.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

4.   Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hundt ("HP

Caliper – An Architecture for Performance Analysis Tools," 8/2000) in view of Srivastava et al.

(US Patent 5,963,740) hereafter "Srivastava."

Per claim 1:

Hundt discloses inlined probes into functions and relocated instrumented functions

(section 4.1 Algorithm). Hundt does not explicitly teach identifying an inlined function in

sourced code wherein the source code is for a binary executable. However, Srivastava teaches it

was known in the pertinent art, at the time applicant's invention was made, to "improve

execution performance (col. 13 lines 42-53). It would have been obvious for one having ordinary

skill in the art to modify Hundt's disclosed system to incorporate the teachings of Srivastava.

The modification would be obvious because one having ordinary skill in the art would be

motivated to monitor inlined functions for performance optimization as suggested by Srivastava

(col. 13 lines 42-53).

Hundt further discloses:

-inserting a breakpoint at the start of said inlined function in said binary executable (i.e.

"Probes are inlined into functions and instrumented functions are relocated... Every function's

entry point is patched with a break instruction," section 4.1 Algorithm)

-replacing said inlined function with a long branch to a shared memory probe code

sequence (i.e. "original function's entry point is patched with a long branch instruction to   its

instrumented version (page 5, 4.1 Algorithm)."

Per claim 2:

The rejection of claim 1 is incorporated, and further, Hundt teaches:

-creating a data structure which maintains location information for said inlined function

and information related to said desired task for said inlined function (i.e."The function is

analyzed for instrumentability, probe codes are inlined into the function, IP-relative

references are updated, counters are created, and an instrumented version of the

function is moved to shared memory. The original function's entry point I patched with a long

branch instruction to its instrumented version," section 4.1 Algorithm) as claimed.

Per claim 3:

The rejection of claim 1 is incorporated, and further, Hundt teaches:

-using said performance analysis tool to perform instrumentation on said inlined function

(i.e."The process runs until it hits one of the inserted break instructions at the entry point

of a function...and the instrumentation process begins at the current function," section

4.1. Algorithm) as claimed.

Per claim 4:

The rejection of claim 1 is incorporated, and further, Hundt teaches:

- using said performance analysis tool to perform mapping of samples to said inlined

function (i.e. "The Caliper Support Library offers a framework of services and tools for

dynamic instrumentation and sampling," page 3 last paragraph; "a strong set of tools and

methods used to analyze and monitor run-time behavior of a program. Statistical

sampling and binary instrumentation are two of the major techniques," page 1

paragraph 4) as claimed.

Per claim 5:

The rejection of claim 1 is incorporated, and further, Hundt teaches:

- said performance analysis tool is comprised of an instrumentation application (i.e. "The

Caliper Support Library offers a framework of services and tools for dynamic

instrumentation and sampling," page 3 last paragraph; "a strong set of tools and

methods used to analyze and monitor run-time behavior of a program. Statistical

sampling and binary instrumentation are two of the major techniques," page 1

paragraph 4) as claimed.

Per claim 6:

The rejection of claim 1 is incorporated, and further, Hundt teaches:

- said performance analysis tool is comprised of a sampling application (i.e. "The

Caliper Support Library offers a framework of services and tools for dynamic

instrumentation and sampling," page 3 last paragraph; "a strong set of tools and

methods used to analyze and monitor run-time behavior of a program. Statistical

sampling and binary instrumentation are two of the major techniques," page 1

paragraph 4) as claimed.

Per claims 7-12, they are the computer-readable medium versions of claims 1-6,

respectively, and are rejected for the same reasons set forth in connection with the rejection of

claims 1-6 above.

Per claims 13-18, they are the apparatus versions of claims 1-6, respectively,

and are rejected for the same reasons set forth in connection with the rejection of claims

1-6 above.

Per claim 19:

The rejection of claim 1 is incorporated, and further, Hundt teaches:

- said shared memory probe code sequence saves registers, executes the original bundle

of said inlined function, restores said registers, and jumps back to said computer code

(i.e. "HP Caliper", 4.1 Algorithm; page 3 last paragraph).

Per claim 20:

The rejection of claim 1 is incorporated, and further, Hundt teaches:

-reading source correlation information from within said binary executable; and obtaining

start and end addresses for said inlined function using said source correlation

information (i.e. "HP Caliper", 4.1 Algorithm ; page 3 last paragraph).

Per claims 21-22, they are the computer-readable medium versions of claims 19-

20, respectively, and are rejected for the same reasons set forth in connection with the

rejection of claims 19-20 above.

Per claims 23-24, they are the apparatus versions of claims 19-20, respectively, and are

rejected for the same reasons set forth in connection with the rejection of claims 19-20 above.

Response to Arguments

5.   Applicant's arguments filed on 2/26/2007 have been fully considered but they are not

persuasive.

The applicant states that: the routines in Srivastava are exemplary user instrumentation

and analysis routines that can be used to monitor different operating characteristics of the

program. Srivastava's program 100 is not source code...program 100 is derived from the

executable code 60, not the source code modules 21-23.

In response to the statement above, the instant specification states that "the invention is

performed identifying an inlined function using a performance analysis tool (i.e. page 2)" based

on the source correlation information contained within the executable used to obtain the inline

function location information (page 9).   Srivastava also uses an instrumentation and

performance analysis tool (such as INLINE routines) to "identify and locate specific program

components (col. 2 lines 65-67)," such as in-line procedures, "to be monitored during execution

(col. 2 lines 65-67)" of the program. As is known, an inline function is one in source code where

a compiler copies the code from the inlined function definition directly into the calling function

code instead of creating a separate set of code in memory to avoid the performance overhead of a

function call. The INLINE routines in Srivastava "identify procedures of the program which

may be placed in-line to improve execution performance (col. 13 lines 41-47)" based on the

referenced address information contained within the executable (of the program) used to obtain

the location information of the in-lined procedures within the source code (i.e. col. 4 lines 45-55;

col. 2 lines 35-55). The address information contained within the executable is referenced to

"resolve the logical addresses when the source program is converted to executable form (i.e. col.

4 lines 45-55; col. 2 lines 35-55)." Therefore, Srivastava's INLINE routines identify inlined

functions within the source code wherein said source code is for a binary executable.

Conclusion

6.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Insun Kang whose telephone number is 571-272-3724. The examiner can normally be reached on M-R 6:30-5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MENG AI AN can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

IK
AU 2193

MENG-AL T. AN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100